AMENDMENTS TO THE CLAIMS

Please amend Claim 39 as indicated below.

1.-38. (Canceled)

39. (Currently Amended) An apparatus for controlling the movement of a surgical tool to be inserted into the body of a patient, comprising;

a controllable magnetic field source having a first cluster of electromagnet poles and a second cluster of electromagnet poles, said first cluster of poles substantially opposed to said second cluster of poles;

a tool having a distal end responsive to said magnetic field, wherein said distal end comprises a magnetic element positioned longitudinally therein, said magnetic element comprising a proximal pole and a distal pole;

a servo system that controls said location of said distal end with said controllable magnetic field source;

one or more magnetic field sensors configured to sense a current position of said proximal pole and said distal pole of said magnetic element in said distal end wherein the current position of the magnetic element is determined based on the magnitude of a resultant force vector (B) generated by the controllable magnetic field source and further based on the direction of the force vector B;

wherein the magnitude of the resultant force vector B is determined from three orthogonal components (Bx, BY, Bz) associated with at least six electromagnets wherein the magnitude of the force vector B is given by the equation:

$$B = \sqrt{Bx^2 + By^2 + Bz^2}\,,$$

and wherein the direction of the force vector B is determined with at least three resultant angles between the three orthogonal components with the following equations:

$$\alpha = \frac{\cos^{-1} Bx}{B}, \quad \beta = \frac{\cos^{-1} By}{B}, \quad \delta = \frac{\cos^{-1} Bz}{B};$$

an auxiliary device comprising at least one of the group consisting of: an x-ray device, an ultrasound device, and a radar device, wherein said auxiliary device is configured to obtain dynamic position data concerning a dynamic position of an organ of a patient;

a system controller that is configured to process said dynamic position data of said organ obtained by said auxiliary device, and said current position of said proximal pole and said distal pole of said distal end obtained by said magnetic field sensors to compute a position error between said desired position of said distal end and said current position of said distal end, such that said system controller computes said position error to compensate for said dynamic position of said organ, and wherein said system controller is further configured to ~~control~~ alter the controllable magnetic field source with the servo system based on the position error data such that said distal end moves substantially in unison with a natural motion of said organ; and

a user control device to provide user inputs to said system controller wherein said system controller provides tactile feedback to a user through said user control device when said position error exceeds a predetermined value while simultaneously compensating for said dynamic position as said distal end moves substantially in unison with a natural motion of said ~~wall~~ organ.

40. (Previously Presented) The apparatus of Claim 39, said distal end comprising one or more piezoelectric rings.

41. (Previously Presented) The apparatus of Claim 39, said distal end comprising one or more piezoelectric rings for providing sensor data to a system controller.

42. (Original) The apparatus of Claim 39, further comprising an operator interface unit.

43. (Original) The apparatus of Claim 39, wherein said first cluster of poles is connected to said second cluster of poles by a magnetic material.

44. (Canceled)

45. (Previously presented) The apparatus of Claim 39, further comprising:

a Virtual Tip Calibration Fixture.

46. (Original) The apparatus of Claim 39, further comprising:

a communication controller;

a calibration fixture; and

one or more temperature sensors.

47. (Previously presented) The apparatus of Claim 39, wherein said one or more sensors comprise one or more temperature sensors paired with one or more magnetic sensors.

48.-66. (Canceled)